



LIBRARY COPY

JUN 21 1965

ONTARIO WATER  
RESOURCES COMMISSION

## ANNUAL REPORT

1962

TOWN OF TRENTON

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at [copyright@ontario.ca](mailto:copyright@ontario.ca)

ANNUAL REPORT

ON

TOWN OF TRENTON

SEWAGE TREATMENT PLANT

OWRC PROJECT

57-S-4

TRENTON SEWAGE TREATMENT PLANT

OPERATED FOR

THE TOWN OF TRENTON

BY

THE ONTARIO WATER RESOURCES COMMISSION

Mr. A. M. Snider

Chairman

Dr. A. E. Berry

General Manager

Mr. D. S. Caverly

Asst. General Manager

and Director, Plant Operations

Mr. B. C. Palmer

Assistant Director,

Plant Operations Division

Mr. A. Clark

Project Engineer,

Plant Operations Division

Prepared by the

Division of Plant Operations

## TOWN OF TRENTON

### TYPE OF PLANT

Primary Treatment with provision for extension to complete treatment.

### DESIGN POPULATION

12,000 persons initially; 15,000 persons when extended to complete treatment and with provision for doubling to 30,000 persons. Initial grit removal, screening and outlet sewer facilities sized for 30,000 population.

### PER CAPITA FLOW

83.3 Gallons per day.

### DESIGN PLANT FLOW

1:0 MGD = 111.0 cu. ft./min = 6,670 cu. ft./hr.

5 day BOD of raw sewage:

250 ppm

Removal 35%

Suspended solids of raw sewage:

200 ppm

Removal 55%

### DIAMETER OF INLET SEWER:

24"

### DIMENSION OF INLET CHAMBER: 4'-3" x 3'-9" x 11'-3"

The raw sewage flows through a 24" x 24" sluice gate into the aerated grit chamber from an inlet chamber.

### DIMENSION OF GRIT CHAMBER:

10'-0" x 8'-6" x 9'-0"

### VOLUME OF AERATED GRIT CHAMBER:

765 cu. ft. (not including the hopper)

### DETENTION PERIOD:

@ 1. MGD - 6.95 minutes

Grit removal by air lift to decanting trough and wheel barrow.

The sewage flows to the screen chamber and thereafter to the distribution channel of the settling tanks.

SCREENING

1 hand cleaned bar screen, with provision for installation of mechanically cleaned bar screen for ultimate plant capacity.

AVAILABLE AREA:

5.29 sq. ft.

PRIMARY SETTLING TANK:

2 units

DIMENSION OF TANKS:

2 (52' x 16' x 12')

VOLUME OF TANKS:

20,000 cu. ft. (not including the sludge hopper)

DETENTION PERIOD @ 1 MGD

$$\frac{20,000}{8350} = 2.4 \text{ hours}$$

SURFACE SETTLING RATE: @ 1 MGD

$$\frac{1,000,000}{2 (52' \times 16')} = 600 \text{ gal/feet}^2 \text{ of tanks/day}$$

$$\text{@ 1.25 MGD} \quad \frac{1,250,000}{2 (52 \times 16)} = 755 \text{ gals/feet}^2 \text{ of tanks/day}$$

WEIR OVERFLOW RATE:

$$\frac{1,000,000}{120} = 8300 \text{ Gals/lin. ft. of weir/day}$$

$$\text{@ 1.25 MGD} \quad \frac{1,250,000}{120} = 10,400 \text{ Gals/lin. ft. of weir/day}$$

RAW SLUDGE REMOVAL:

Longitudinal sludge collector to single sludge hopper each pass of settling tank.

TWO DIGESTION TANKS, TWO STAGE OPERATION

DIMENSION OF TANKS:

Diameter 28')  
Depth 23') No. 1.

Diameter 28')  
Depth 22') No. 2.

TOTAL VOLUME OF TANKS: 12,717 + 12,117

HEATED DIGESTERS CAPACITY

$$\frac{24,834}{12,000} = 2.08 \text{ cu. ft./capita}$$

First stage tanks is heated by a sludge heater of capacity, 170,000 BTU per hour.

Recirculation of gas in the first stage tank is by gas pump with a capacity of 150 cfm. Gas withdrawn is used for plant heating as available. Provision has been made for both digestion tanks to be used as first stage tanks when the plant is extended for 15,000 persons, and a third digestion tank will be constructed as a second stage tank.

DIGESTED SLUDGE DISPOSAL:

Digested sludge is disposed of by tank truck haulage.

VALVE HOUSE BETWEEN TWO DIGESTION TANKS:

Dimensions

Main Floor 12'-0" x 11'-8" x 12'-6" high

Basement 12'-0" x 11'-8" x 8'-0" high

CHLORINATION OF EFFLUENT

One vacuum type chlorinator with capacity up to 350 lbs. chlorine per day gives a maximum dosage of 35 parts per million at average flow. A chlorine pipe direct from the control building, discharges to outlet chamber.

METERING

Total plant flow - by Venturi Meter

AIR BLOWERS:

Two air blowers for aerated grit chamber and settling tank, entry channel, aeration.

Maximum Capacity of each blower is 75 cfm

OUTLET:

Effluent is discharged to the Bay of Quinte at the mouth of the Trent River, through a 30" diameter outlet to 500 ft. off shore.

SEWAGE PUMPING STATION ON DUNDAS STREET

PUMP NO.: 1

CAPACITY: 700 IGPM

TOTAL HEAD: 53 feet

POWER REQUIREMENT

$$\frac{700 \times 53}{3300 \times 0.85} = 13.4 \text{ HP}$$

MAXIMUM PUMP R.P.M.:

Revolutions per minute: 900

PUMP NO. 2

CAPACITY: 3130 IGPM diesel - working through Johnson R.A. gear dr.

TOTAL HEAD:

100 feet

MAXIMUM PUMP R.P.M.

900

PUMP NO.: 3

CAPACITY: 1740 IGPM

TOTAL HEAD: 65 feet



POWER SUPPLY:

$$\frac{1740 \times 65}{3300 \times 0.85} = 40.3 \text{ HP}$$

MAXIMUM PUMP R.P.M.:

600

Total Capacity of three pumps: 5570 IGPM

Pumps Nos. 2 and 3 have identical casing so that the capacity of pump No. 3 may be increased in future to the capacity of pump No. 2.

Electric motors for driving the pumps Nos. 1 and 3 are drip-proof vertical, squirrel-cage induction type, suitable for full voltage starting and operation on three phase, 60 cycle alternating current. The meters comply with NEMA standards. The diesel engine is of a type suitable for operation on No. 2 fuel oil.

An auxiliary fuel pump is supplied and installed integrally with the engine.

Bar screens at the inlet consist of two sections of 2" x  $\frac{1}{4}$ " bars, i.e. 2 sections of 15 bars @ 2" centers.

OVERFLOW PIPE:

24" diameter

There is a force main on an easement from the Dundas Street pumping station on Ontario Street. It comprises 168' of 20"  $\phi$  and on Ontario St. Foundry Street, the Easement and the Corporation land from the Easement to the sewage treatment plant 2,800 feet of 16"  $\phi$  pipe.

## OPERATION

Operation mostly routine. Rags in the sewage still caused problems as in previous years and on several occasions town forces assisted the operator in removing these rags from the air degritter.

The water service to the Dundas Street pumping station broke in July 1962 and the Trenton P.U.C. repaired the break together with other leaks.

During heavy rainfall, flooding occurred at the pumping station and on at least one occasion town forces assisted in clean up.

Consideration was given to the installation of a pump to supply bay water for cleaning tanks and operating the chlorinator. Due to the town's sanitary land fill program and the distance from the plant to water's edge, the project was postponed.

Good sludge digestion was achieved and, as in previous years, digested sludge was hauled by town forces to the land fill project. Towards the end of the year, sludge was pumped directly to the land fill operation. Much of the plant property is now at a lower elevation than the surrounding fill and in 1963 the plant property will be filled to an elevation higher than the surrounding land fill.

Flows to the plant continue to be high but removal of BOD and SS is exceptionally good for this type of plant.

Indications are that there is still considerable infiltration to municipal sewers. This is evidenced by the flooding of the wet well at Dundas Street pumping station during rain storms.

### SERVICE CALLS

During the year, there were 9 visits by the project engineer. These were for inspection and direction of the operator.

The mechanical maintenance section spent 140 man hours in Trenton. These hours were spent in inspection and repairs. Some 20 man hours were spent overhauling the flow meter and 37 man hours were spent repairing the #1 pump at Dundas Street Pumping Station.

Metering and control section made three trips, one of which was to conduct emergency repairs after lightning damage.

During the year, 42 purchases were processed through head office at 801 Bay Street, Toronto.

### SYSTEM ENLARGEMENT

During 1962, trunk sewers were installed on Sidney and Front Streets. This work was substantially completed in December of that year.

The total value of this work, done by Tatham Company Limited was \$174,642.70.

PLANT PERFORMANCE

RAW SEWAGE				FINAL EFFLUENT			
BOD		SS		BOD		SS	
PPM	LBS.	PPM	LBS.	PPM	LBS.	PPM	LBS.
Avg	Total	Avg	Total	Avg	Total	Avg	Total
149	725,019	226	1,099,693	47	228,697	59	287,088

Summary of Removal

BOD		SS	
PERCENT	POUNDS	PERCENT	POUNDS
68.5	496,322	74	812,605

The total sewage treated was 486,590 million gallons.

During the year, 496,322 pounds of BOD were removed and 812,605 pounds of SS were removed.

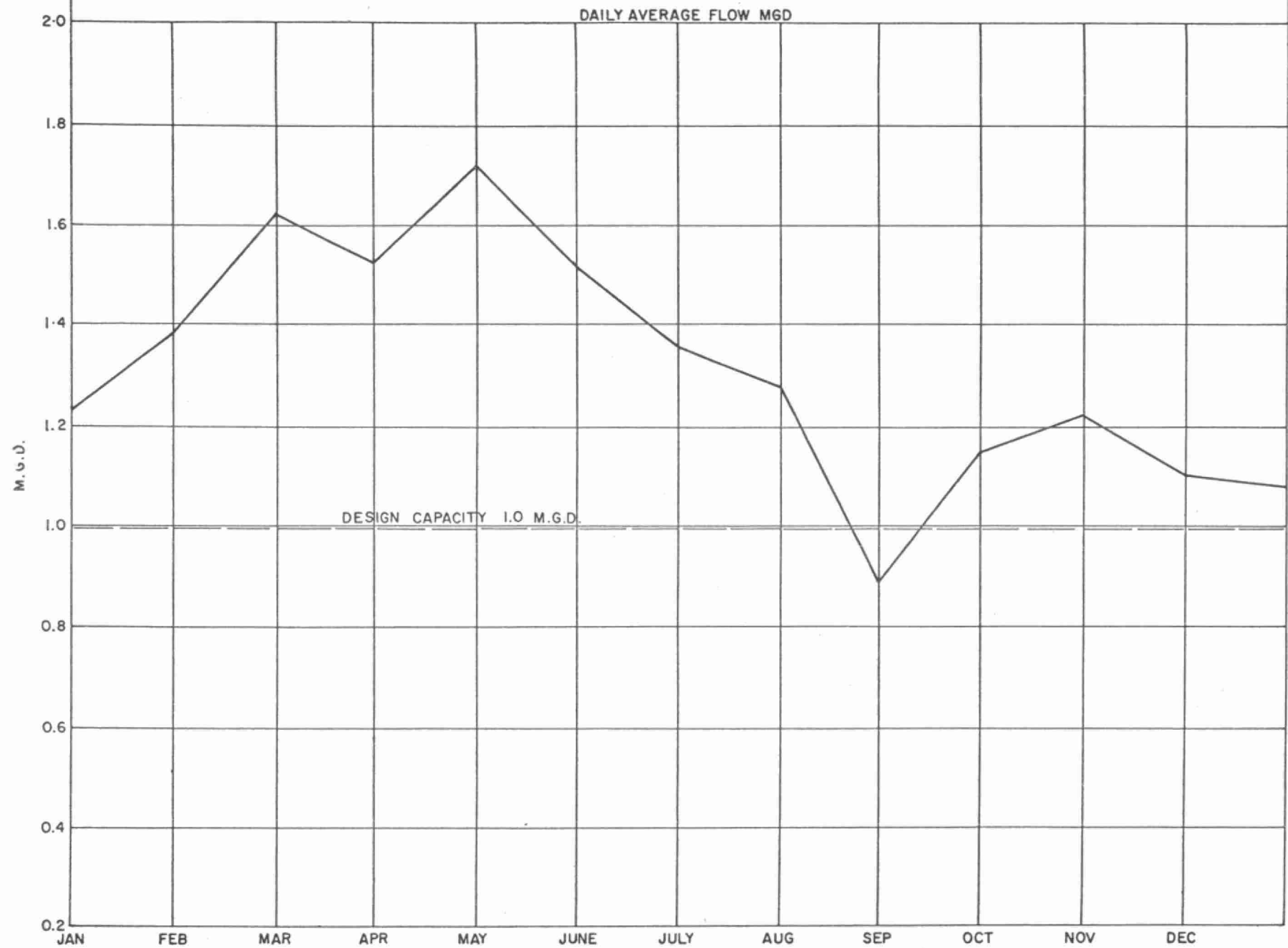
OPERATING EXPENSES - 1962

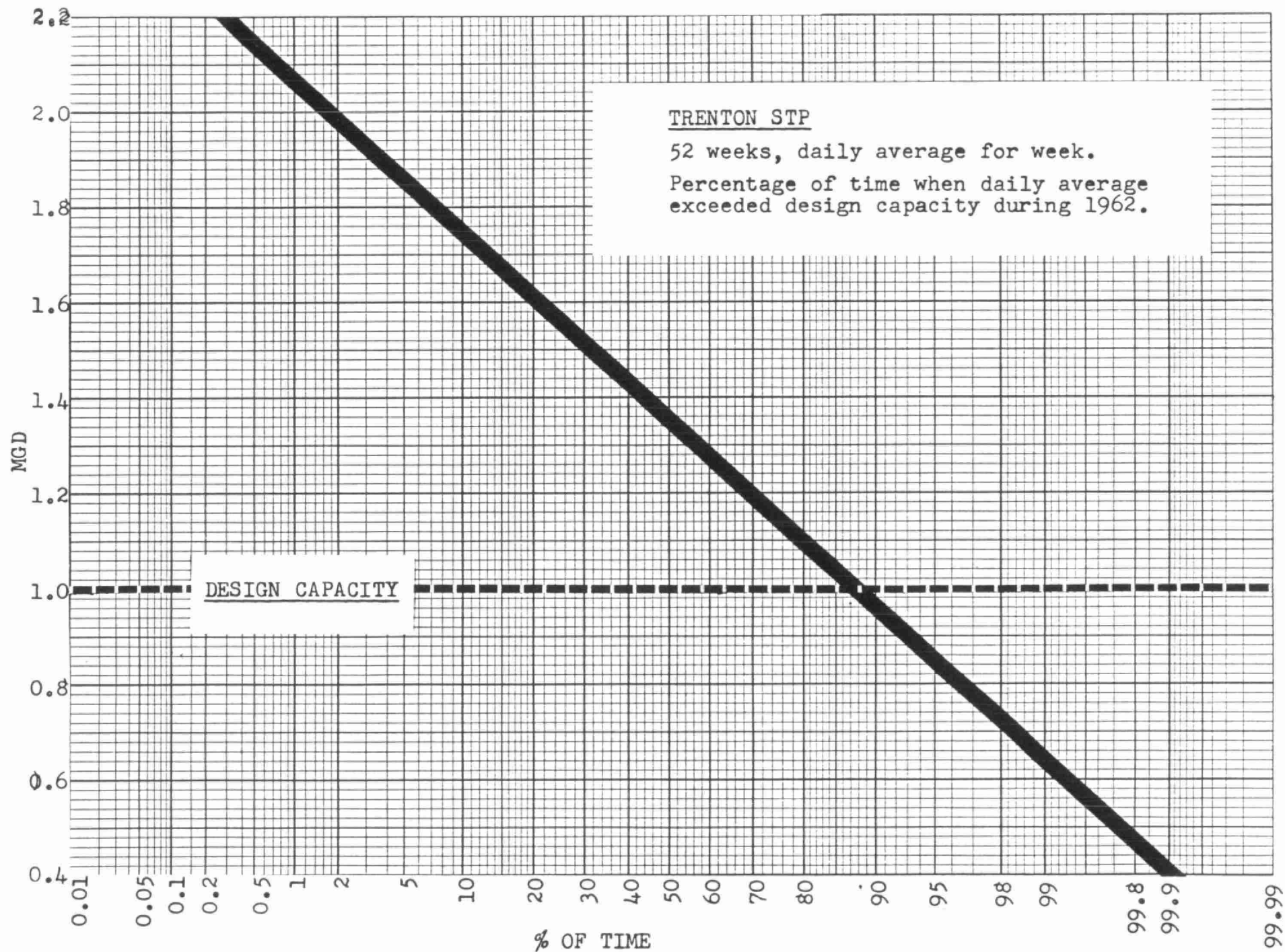
Payroll	\$ 4,323.64
Fuel	528.45
Power	2,459.05
Water	718.42
Chemicals	1,691.20
General Supplies	1,289.44
Equipment	395.53
Maintenance and Repair	620.93
Sundry	550.78
	<hr/>
	\$ 12,577.44

Cost per 1,000 gallons of sewage treated -	2.58¢
Cost per pound BOD removed -	2.53¢
Cost per SS removed -	1.55¢

The three graphs enclosed are self-explanatory.

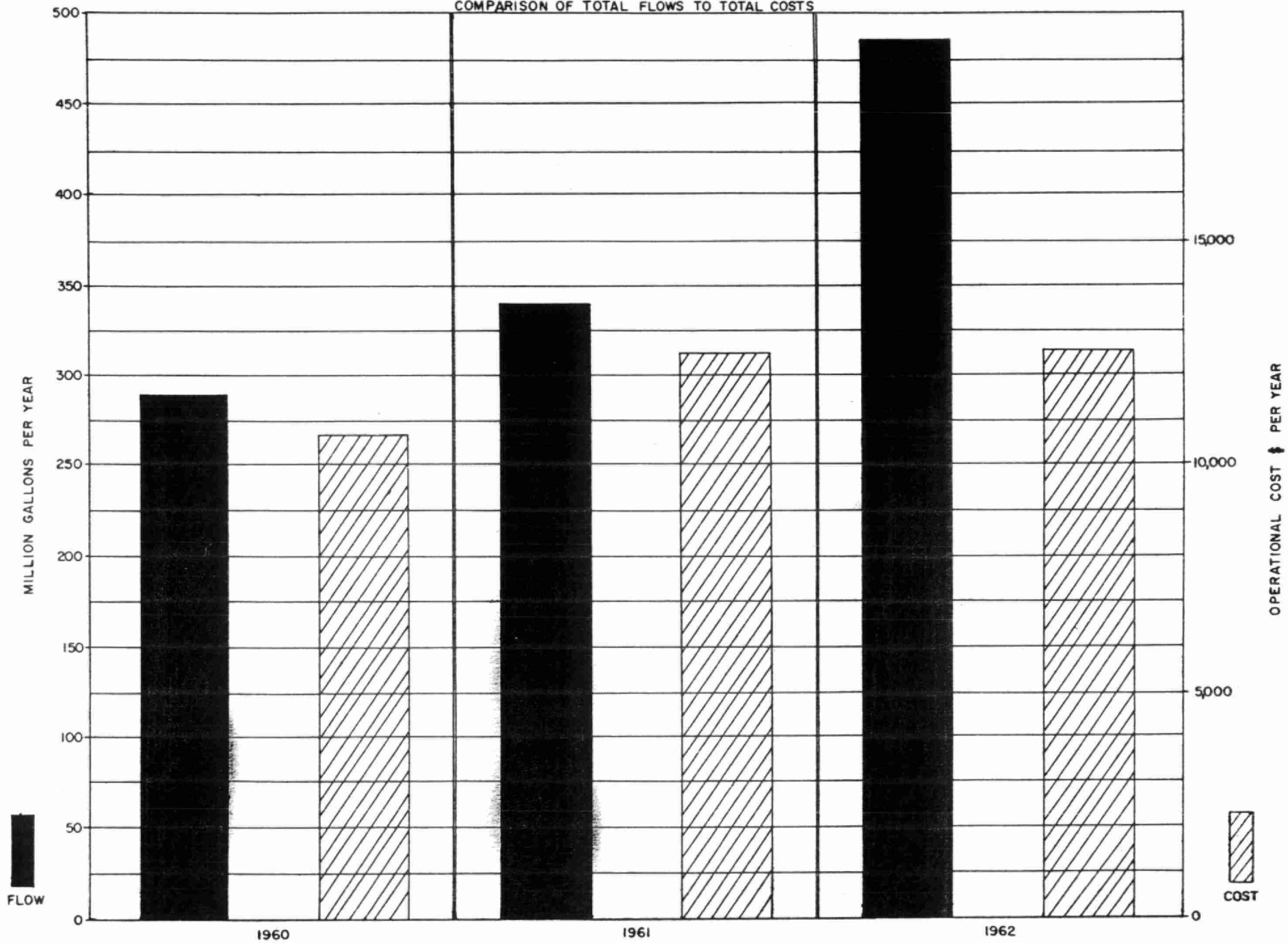
# TRENTON SEWAGE TREATMENT PLANT





# OWRC TRENTON SEWAGE SYSTEM

COMPARISON OF TOTAL FLOWS TO TOTAL COSTS





ANALYSES

The following figures are in parts per million:

	<u>Raw Sewage</u>		<u>Final Effluent</u>	
	BOD	SS	BOD	SS
Jan. 9th	150	180	64	70
Feb. 13th	185	282	78	96
Mar. 19th	90	186	33	46
Apr. 9th	155	344	48	102
May 15th	125	186	36	58
Jan. 19th	155	136	26	21
July 17th	-	-	55	57
Aug. 15th	114	180	29	56
Sept. 4th	185	380	44	62
Oct. 10th	160	201	32	30
Nov. 7th	155	177	36	40
Dec. 8th	170	238	78	73

Totals

GAS PRODUCTION

	<u>Cubic Feet</u>
January	138,244
February	131,533
March	139,887
April	153,330
May	142,760
June	122,402
July	173,235
August	177,723
September	132,825

	<u>Cubic Feet</u>
October	172,039 cu. ft.
November	179,935
December	176,595

#### SUMMARY

The plant operated efficiently throughout the year.

Operating costs compared favourably with those in other parts of the province.

Sludge digestion was exceptionally good and high gas production cut heating costs.

Housekeeping was good and the operator performed his tasks in a satisfactory manner.

LABORATORY LIBRARY



\*96936000119727\*

